

40. The filtering face mask of claim 68, wherein the flexible flap has a stress relaxation sufficient to keep the flexible flap in an abutting relationship to the seal surface under any static orientation for 24 hours at 70 °C.

42. The filtering face mask of claim 68, wherein the flexible flap is made from a crosslinked polyisoprene.

43. The filtering face mask of claim 68, wherein the flexible flap has a Shore A hardness of about 30 to 50.

44. The filtering face mask of claim 68, wherein the flexible flap has a generally uniform thickness of about 0.2 to 0.8 millimeters.

47. The filtering face mask of claim 68, wherein the one free portion of the flexible flap has a profile that comprises a curve when viewed from the front, which curve is cut to correspond to the general shape of the seal surface.

50. The filtering face mask of claim 68, wherein the stationary segment of the peripheral edge of the flexible flap includes about 10 to 25 percent of the total peripheral edge of the flexible flap, with the remaining 75 to 90 percent being free to be lifted from the seal surface.

51. The filtering face mask of claim 68, wherein the valve seat includes a flange that provides a surface onto which the exhalation valve can be secured to the mask body, and wherein the flange extends 360 degrees around the valve seat where the valve seat is mounted to the mask body.

52. The filtering face mask of claim 68, wherein the flexible flap is positioned on the valve such that exhaled air is deflected downward during an exhalation when the filtering face mask is worn on a person.

53. The filtering face mask of claim 68, wherein the mask body is cup-shaped and comprises (1) at least one shaping layer for providing structure to the mask, and (2) a filtration layer, the at least one shaping layer being located outside of the filtration layer on the mask body.

54. The filtering face mask of claim 68, wherein a high percentage of the exhaled air is purged through the exhalation valve.

10 11 55. The filtering face mask of claim 68, wherein at least 60 percent of the total airflow flows through the exhalation valve under a normal exhalation test.

12 2 58. The filtering face mask of claim 68, wherein the exhalation valve is positioned on the mask body substantially opposite to a wearer's mouth, and wherein the flexible flap is mounted to the valve seat in cantilever fashion.

10/3 60. The filtering face mask of claim 68, wherein the shape of the orifice does not wholly correspond to the shape of the seal surface.

61. The filtering face mask of claim 68, wherein the valve cover has an opening that is disposed directly in the path of fluid flow when the free portion of the flexible flap is lifted from the seal surface during an exhalation.

66. A filtering face mask that comprises:

- (a) a mask body that is adapted to fit over the nose and mouth of a wearer; and
- (b) an exhalation valve that is attached to the mask body, the exhalation valve comprising:

(1) a valve seat that comprises:

- (i) a seal surface;
- (ii) an orifice that is surrounded by the seal surface; and
- (iii) a flap-retaining surface; and

19 14 (2) a single flexible flap that has a stationary portion and only one free portion and a peripheral edge that includes a stationary segment and a free segment, the stationary segment of the peripheral edge being associated with the stationary portion of the flap so as to remain at rest during an exhalation, and the free segment being associated with the one free portion of the flexible flap so as to be lifted away from the seal surface during an exhalation, the free segment also being located below the stationary segment when the filtering face mask is worn on a person and viewed from the front; and

(3) a valve cover that is disposed over the valve seat and that comprises a surface that mechanically holds the flexible flap against the flap-retaining surface, wherein the flexible flap is held against the flap-retaining surface and is positioned relative to the seal surface such that the flap is pressed towards the seal surface in a substantial abutting relationship therewith under any orientation of the valve when a fluid is not passing through the orifice.

(Kindly add claims 68-75 to this application:)

68. A filtering face mask that comprises:
(a) a mask body that is adapted to fit over the nose and mouth of a wearer; and
(b) an exhalation valve that is attached to the mask body, the exhalation valve comprising:

(1) a valve seat that comprises:

- (i) a seal surface;
(ii) an orifice that is surrounded by the seal surface; and
(iii) a flap-retaining surface; and

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(2) a single flexible flap that has a stationary portion and only one free portion and a peripheral edge that extends 360° about the flap and that includes a stationary segment and a free segment, the stationary segment of the peripheral edge being associated with the stationary portion of the flap so as to remain at rest during an exhalation, and the free segment being associated with the one free portion of the flexible flap so as to be lifted away from the seal surface during an exhalation, the free segment also being located below the stationary segment when the filtering face mask is worn on a person and viewed from the front; and

(3) a valve cover that is disposed over the valve seat and that comprises a surface that holds the flexible flap against the flap-retaining surface such that the flap is pressed towards the seal surface in an abutting relationship therewith when a fluid is not passing through the orifice under any orientation of the valve, the point where the flexible flap is mechanically held against the flap retaining surface being located off center relative to the flap.

69. The filtering face mask of claim 68, wherein the valve cover is secured to the valve seat by a friction fit to a wall of the valve seat.

70. The filtering face mask of claim 68, wherein the valve cover has fluid-impermeable opposing sidewalls that support a fluid impermeable ceiling, and wherein the valve cover has an opening that is disposed directly in the path of fluid flow, the fluid-impermeable sidewalls and the ceiling and the positioning of the opening in the valve cover causing fluid flow to be directed downwardly away from a wearer's eyes during an exhalation when the mask is worn by a person.

71. The filtering face mask of claim 70, wherein the flexible flap is mechanically clamped between the surface on the valve cover and the flap-retaining surface.

72. The filtering face mask of claim 68, wherein the flap-retaining surface is not disposed substantially in the path of the exhale flow stream.

73. The filtering face mask of claim 68, wherein the orifice includes a plurality of openings, which plurality of openings are disposed within the orifice beneath where the flexible flap is mounted to the valve seat when viewing the filtering face mask from the front in an upright position.

74. The filtering face mask of claim 73, wherein the exhaled air passes primarily through the plurality of openings within the orifice during an exhalation by a wearer of the mask.

75. The filtering face mask of claim 74, wherein the flap-retaining surface is located outside the region defined by the plurality of openings.